June 21, 2017

Attn: William Hoang

Springboard

New York, NY

**Re: Capstone Project Proposal**

**Introduction**:

Walmart’s acquisition of Jet.com for $1.3 billion and Amazon’s acquisition of Whole Foods for $13.7 billion are symptomatic of an anxiety surrounding the future of retail. No superlatives have been spared to describe the trend, despite eCommerce accounting for no more than 9% of US retail spend, as of Q1 2017. At its very core, this shift falls under the domain of Supply Chain Management; products and services are experiencing a wildly different lifecycle between the point of production and the point of consumption.

The result is that retailers with lean, adaptive supply chains will win. The implicit imperative behind retail’s changing landscape is the need to predict and adapt to consumer habits, which makes for some supremely interesting Supply Chain questions.

**Instacart Kaggle Competition**:

It wasn’t accidental that I mentioned Whole Foods above. Instacart is an online grocery and delivery app. The shopping experience is driven by data scientists that curate the products that you see. The current $20 billion Americans spend at online groceries represents a meager 2.5% of the estimated $800 billion US grocery market, where perishable goods make predicting consumer buying habits a matter of life or death (figuratively, except for the produce). Demand forecasting being a cornerstone of Supply Chain Management (SCM), I see this challenge as an opportunity to explore the domains that have driven my career thus far – eCommerce and SCM – through the lens of data science.

**Competition Overview**:

Instacart provides an open-source dataset of over 3 million orders from 200,000 users, in a competition aimed at producing an algorithm capable of predicting what returning users will order next. Instacart will use this algorithm to refine its product recommendations and personalize the digital shopping experience.

The dataset includes order data, like basket assortment, day of the week, and hour of the day, as well as anonymized customer and product data, like order history and product category. Submissions will include a list of products for a given order, and will be evaluated using mean F1 score.

**Client**:

Instacart.

**Who Cares?**

For starters, Instacart, which is shelling out $25,000 for this competition and accepting resumes for top performers. Broadly speaking, predictive algorithms in the Demand Forecasting space are hugely valuable in the evolving realm of retail eCommerce, where logistics present unique difficulties for perishable and frozen products, among others, that generally have never been put in a USPS box (until recently).

**Who Cares? (Cont’d.)**

The ability to forecast demand, even if the resulting efficacy is ever-so-slight, will have a giant impact on Instacart’s supply chain and logistics operations, let alone their customers, who will benefit from more personalized experiences, fresher groceries, and foregone queues at the market. In an unnecessary summation of the value of predictive algorithms: one day means a lot to a banana (microphone dropped).

(Microphone retrieved) While a specific online grocer will immediately benefit from this analysis, demand forecasting in eCommerce is a critical part of SCM, and having run operations of an eCommerce home improvement retailer for the past three years, I can say with certainty that I could have made use of the resources and skills that I’ll benefit from over the course of this project.

**Methodology**:

**Deliverables**:

I will most likely deliver the code in the form of a Jupyter notebook documenting the Exploratory Data Analysis and resulting algorithm, in addition to the competition submission itself. I will also produce a formal thesis on my findings, as well as a deck for the faint-hearted.

I’m looking forward to jumping in. Thank you very much!

Respectfully,

Ryan Alexander Alberts

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